WHAT IS CLAIMED IS:

1.　　A decoding apparatus for decoding parallel concatenated coded data comprising:

　　　　soft output decoding means of a plurality of stages for performing decoding processing repeatedly;

　　　　means for comparing data which is decoded this time with data which is decoded previous time, both of which are decoded in the repetitive decoding processing;

　　　　means for detecting error of resulting decoded data using error detecting codes; and

　　　　means for finally judging whether or not error is generated in accordance with output data from the error-detecting means and output data from the comparing means.

2.　　The decoding apparatus as set forth in Claim 1, wherein

　　　　the comparing means obtains the number of discordant sign bits by comparing sign bits of this time with sign bits of previous time, the sign bits being included in output data from the last stage of the soft output decoding means of the. plural stages, and

　　　　in case the number of discordant sign bits is larger than a predetermined value, the judging means determines that there is generated error even though the error detection result shows that there is generated no error.

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3.   A decoding method for decoding parallel concatenated coded data, in performing decoding processing repeatedly using soft output decoding means of a plurality of stages, the decoding method comprising the steps of:

comparing data which is decoded this time with data which is decoded previous time, both of which are decoded in the repetitive decoding processing;

detecting error of resulting decoded data using error detecting codes; and

finally judging whether or not error is generated in accordance with error detecting output data obtained at the error-detecting step and comparing output data obtained at the comparing step.

4.   The decoding method as set forth in Claim 3, wherein

the comparing step obtains the number of discordant sign bits by comparing sign bits of this time with sign bits of previous time, the sign bits being included in output data from the last stage of the soft output decoding means of the plural stages, and

in case the number of discordant sign bits is larger than a predetermined value, the judging step determines that there is generated error even though the error detection result shows that there is generated no error.

5.   A data receiving apparatus which has soft output decoding means of a plurality of stages for receiving parallel concatenated coded data and decoding the data repeatedly, comprising:

means for comparing data which is decoded this time with data which is

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decoded previous time, both of which are decoded in the repetitive decoding processing;

means for detecting error of resulting decoded data using error detecting codes; and

retransmission controlling means for sending a signal requesting retransmission of data in accordance with output data from the comparing means and output data from the error-detecting means.

6. The data receiving apparatus as set forth in Claim 5, wherein the retransmission controlling means sends the signal requesting retransmission of data in case the error-detecting means determines that there is generated error, and changes retransmitting manner in accordance with the output data from the comparing means.

7. The data receiving apparatus as set forth in Claim 6, wherein

the comparing means compares sign bits of this time with sign bits of previous time, the sign bits being included in output data from the last stage of the soft output decoding means of the plural stages, and

the retransmission controlling means sends the signal requesting retransmission of data in case the error-detecting means determines that there is generated error, and changes the retransmitting manner in accordance with the number of discordant sign bits obtained by the comparing means.

8. The data receiving apparatus as set forth in Claim 7, wherein

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the received coded data is punctured codes which has a portion of data

thereof deleted at an encoding side, and

the retransmission controlling means sends the signal requesting

retransmission of data by selecting one of retransmission of the deleted data,

retransmission of original punctured codes, and retransmission of all data before

being deleted, in accordance with the number of discordant sign bits obtained by

the comparing means.

9. The data receiving apparatus as set forth in Claim 5, wherein the comparing

means compares sign bits of this time with sign bits of previous time, the sign bits

being included in output data from the last stage of the soft output decoding means

of the plural stages, and, in case the number of discordant sign bits is larger than a

predetermined value, it is determined that there is generated error irrespective of

the error detection result, and the retransmission controlling means sends the signal

requesting retransmission of data.

10. The data receiving apparatus as set forth in Claim 9, wherein

the received coded data is punctured codes which has a portion of data

thereof deleted at an encoding side, and

the retransmission controlling means sends the signal requesting

retransmission of data by selecting one of retransmission of the deleted data,

retransmission of original punctured codes, and retransmission of all data before

being deleted, in accordance with the number of discordant sign bits obtained by

the comparing means.

11.   A data receiving method which has function of receiving parallel

concatenated coded data and decoding the data repeatedly by using soft output

decoding means of a plurality of stages, comprising the steps of:

comparing data which is decoded this time with data which is decoded

previous time, both of which are decoded in the repetitive decoding processing;

detecting error of resulting decoded data using error detecting codes; and

retransmission controlling step of sending a signal requesting retransmission

of data in accordance with comparing output data obtained at the comparing step

and error detecting output data obtained at the error-detecting step.

12.   The data receiving method as set forth in Claim 11, wherein the

retransmission controlling step sends the signal requesting retransmission of data in

case the error-detecting step determines that there is generated error, and changes

retransmitting manner in accordance with the comparing output data obtained at the

comparing step.

13.   The data receiving method as set forth in Claim 12, wherein

the comparing step compares sign bits of this time with sign bits of previous

time, the sign bits being included in output data from the last stage of the soft

output decoding means of the plural stages, and

the retransmission controlling step sends the signal requesting retransmission

of data in case the error-detecting step determines that there is generated error, and

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changes the retransmitting manner in accordance with the number of discordant

sign bits obtained at the comparing step.

14. The data receiving method as set forth in Claim 13, wherein

the received coded data is punctured codes which has a portion of data

thereof deleted at an encoding side, and

the retransmission controlling step sends the signal requesting retransmission

of data by selecting one of retransmission of the deleted data, retransmission of

original punctured codes, and retransmission of all data before being deleted, in

accordance with the number of discordant sign bits obtained at the comparing step.

15. The data receiving method as set forth in Claim 11, wherein the comparing

step compares sign bits of this time with sign bits of previous time, the sign bits

being included in output data from the last stage of the soft output decoding means

of the plural stages, and, in case the number of discordant sign bits is larger than a

predetermined value, it is determined that there is generated error irrespective of

the error detection result, and the retransmission controlling step sends the signal

requesting retransmission of data.

16. The data receiving method as set forth in Claim 15, wherein

the received coded data is punctured codes which has a portion of data

thereof deleted at an encoding side, and

the retransmission controlling step sends the signal requesting retransmission

of data by selecting one of retransmission of the deleted data, retransmission of

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original punctured codes, and retransmission of all data before being deleted, in

accordance with the number of discordant sign bits obtained at the comparing step.